



WERE THEY EVEN CLOSE?

# Bulletin of the Atomic Scientists

ISSN: 0096-3402 (Print) 1938-3282 (Online) Journal homepage: <http://www.tandfonline.com/loi/rbul20>

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To cite this article: Kai Erikson (1991) Radiation's Lingering Dread, Bulletin of the Atomic Scientists, 47:2, 34-39, DOI: [10.1080/00963402.1991.11459947](https://doi.org/10.1080/00963402.1991.11459947)

To link to this article: <http://dx.doi.org/10.1080/00963402.1991.11459947>



Published online: 15 Sep 2015.



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# RADIATION'S LINGERING DREAD

By KAI ERIKSON

**Radiological emergencies violate the rules of plot—some, but not all, have clearly defined beginnings, but to the victims, they never end; the “all clear” never sounds.**



**I**t is increasingly obvious, as the special report on radiation and health in last September's *Bulletin* points out in compelling detail, that a good deal more low-level radiation has been released into the environment either by accident or design than any of us have been allowed to know. We have long been aware that many people have been exposed to radioactivity since the beginning of the nuclear age, some because they have been attacked with nuclear weapons, as in Hiroshima and Nagasaki; some because they live downwind from nuclear test sites, as in Nevada and Kazakhstan; and some

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because they have been in the wrong place at the time of a reactor accident, as at Chernobyl. But we are only now learning that radiation has been escaping for years from nuclear weapons plants like the ones at Fernald (Ohio), Rocky Flats (Colorado), and Hanford (Washington) in this country and from nuclear reprocessing plants like the one at Sellafield in England. This will add hundreds of thousands to the roster of the exposed.

Seasoned epidemiologists like Alice Stewart, Thomas Mancuso, and George Kneale are now trying to measure the physical harm done by those releases. But among the hazards to health imposed by radiation is the fact—by now fairly well documented—that it inspires a deep and powerful fear. This dread goes far beyond what scientists and technicians, with their cool ways of calculating risk, consider sensible. What strange passion, they wonder, can induce a whole nation to shudder at the spectacle of Three Mile Island when so many more people are at risk from driving automobiles, smoking cigarettes, or eating animal fats? It is an important question.

When the Three Mile Island emergency was at its height, Governor Richard Thornburgh of Pennsylvania issued a calm and measured advisory suggesting that pregnant women and preschool children within a five-mile radius of the plant might want to evacuate, while everybody else within a distance of 10 miles ought to consider taking shelter in their own homes. In effect, the governor was recommending that 3,500 persons living in the shadows of the reactor relocate for the time being, but that everyone else stay put.

Instead, some 200,000 persons were alarmed enough to take to the public highways, and they fled, on the average, a remarkable 100 miles. For every person advised to leave home, almost 60 did—the widest imbalance on record between the scale of an advisory and the scale of an actual evacuation.<sup>1</sup>

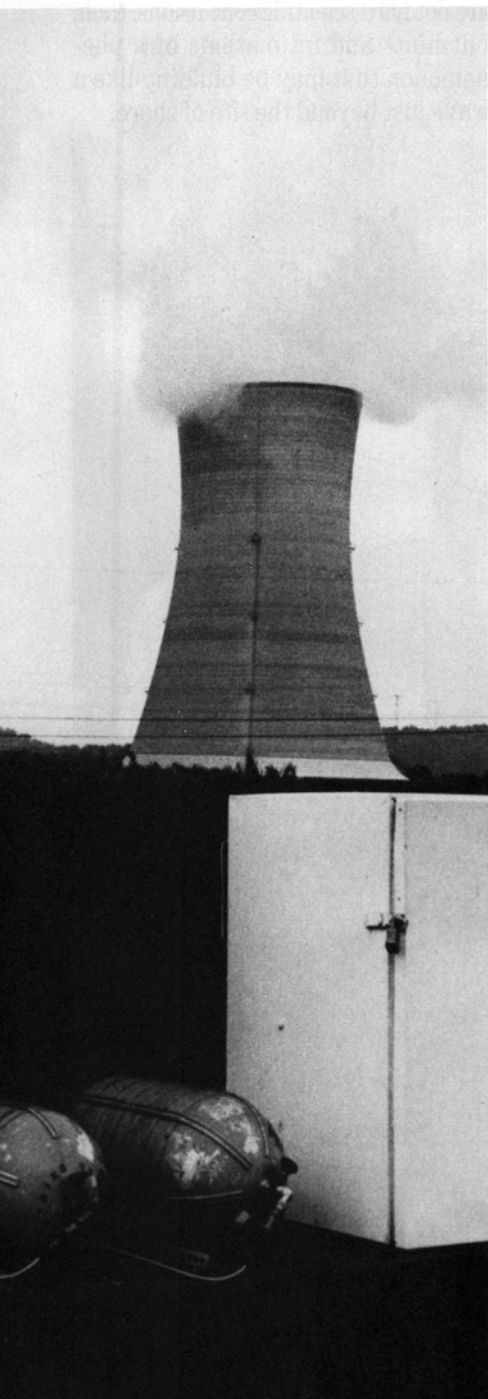
Three young geographers from Michigan State University called this “the evacuation shadow phenomenon,” meaning the gap between what official wisdom called for and what the people at risk, acting on wisdoms of their own,

decided to do.<sup>2</sup> To describe that response as “over-reaction” or “irrationality,” as specialists and laypeople often try to do, is to give it a name without saying anything useful about it at all. The important question is: What were the wisdoms on which the evacuees acted? And the best answer almost certainly is: a profound dread.

What was being feared in this instance was radiation, but it might well have been some other form of toxicity. Radiation is but one strain of a whole new species of trouble that we are sure to see more of in the years to come. The accidents at Three Mile Island and Chernobyl, both involving radiation, are of a kind with recent events at Love Canal and Bhopal, both involving toxic substances of another sort. But radiation clearly has a special place in the human sense of terror, so that will be the focus of the paragraphs to follow.

**T**he first thing to say about radiological events is that they are a product of human hands. The ancients feared pestilence, drought, famine, flood, plague. These miseries trouble us yet, to be sure, but we have learned ways to defend ourselves against many of the worst of them. Some can now be arrested or even prevented altogether, and others can be seen far enough in advance for people to move out of their path.

The irony, though, is that the technological advances which have afforded us this degree of protection from *natural* disasters have created a whole new category of what specialists have come to call *technological* disasters—things that can go wrong when systems fail, humans err, designs prove faulty, engines misfire, and so on. Technological disasters have clearly grown in number as humans test the outer limits of their competence, but they have also grown in scale. This is true in the sense that events of local origin can have consequences that reach across huge distances, as was the case with Chernobyl. And it is also true in the sense that news of it is broadcast so quickly and so widely that it becomes a moment in everyone's history, a datum in everyone's store of knowledge, as was the case with Three Mile Island.



IMPACT VISUALS

Monitoring equipment set up near Three Mile Island.

The distinction between natural and technological disasters is sometimes hard to draw in actuality, but it usually seems distinct enough to victims. Natural disasters are almost always experienced as acts of God or caprices of nature. They happen *to* us. They *visit* us, as if from afar. Technological disasters, however, being of human manufacture, are at least in principle preventable, so there is always a story to be told about them, a moral to be drawn from them, a share of blame to be assigned. They provoke outrage rather than acceptance or resignation. They generate a feeling that the thing ought not have happened, that someone is at fault, that victims deserve not only compassion and compensation but something akin to what lawyers call punitive damages.

The second thing to be said about these events is that they involve radiation: they contaminate rather than merely damage; they pollute, befoul, taint, rather than just create wreckage; they can penetrate human tissue

indirectly rather than wound the surfaces by assaults of a more straightforward kind. And the evidence is growing that they scare human beings in new and special ways. One of the surest findings to emerge from the new field of risk assessment is that people in general find radiation and other toxic substances a good deal more threatening than natural hazards of virtually any kind and technological hazards of considerable danger that do not involve toxicity.<sup>3</sup> Surveys conducted in response to the opening of the Shoreham Nuclear Power Station on Long Island and in response to the government's proposal to build a high-level nuclear waste repository at Yucca Mountain in Nevada are among the most recent confirmations of this finding.

And it is clearly borne out by the few experiences we have to draw on in recent history. In a number of places where radiological and other toxic disasters have struck, the dread lingers long after the incident itself is officially declared over. Fear of radiation was so

strong in the regions surrounding Chernobyl more than two years after the accident there that the government spoke scornfully of "radiophobia." In Goiania, Brazil, where a small release of cesium 137 killed four persons and contaminated hundreds, officials were surprised to discover that apprehensions failed to decline with the passing of time. Even at Three Mile Island, where there is still no evidence of lasting physical damage, levels of anxiety remain higher than the experience of other kinds of disaster would give us any reason to suppose.

This evidence is still far from decisive. Risk assessment studies remain few and scattered; surveys like the ones conducted on Long Island and in Nevada are both infrequent and inconclusive; and accidental laboratories of the kind found in Goiania and Chernobyl are luckily quite rare. What we have are not hard scientific conclusions, then, but hints and intimations of a phenomenon that may be building like a wave just beyond the site of shore.



Fleeing disaster: Harrisburg residents pack up after Three Mile Island accident—3,500 were advised to leave; 200,000 chose to evacuate.

Most technical experts assume that increased experience and familiarity will reduce that dread and sense of mystery over time, and that people will one day become as resigned and philosophical about radiological accidents as they are now about hurricanes or earthquakes. Alvin Weinberg, one of the most thoughtful pronuclear physicists, notes how much easier it is to "scare" people than it is to "unscare" them, but his reading of human history persuades him that people will sooner or later overcome this apprehension as they did their initial fears of electricity.

Perhaps. Time alone can tell. But in the meantime, we have reason to suppose that radiological emergencies simply nourish a dread that may even grow rather than diminish. We will dismiss this fear as irrational if, like most experts, we assess the danger by calculating the odds of an accident and then estimating the number of casualties likely to result from it. But there are other reasonings at work out there in the world.

**W**hy do these emergencies create so much harm? What makes them so different? I will be calling here on the voices of a handful of people who lived through the crisis at Three Mile Island because they lend a certain immediacy to the abstractions with which we would otherwise have to discuss the subject. The voices are those of plaintiffs in a legal action speaking to an interviewer several years after the event, so we cannot assume that they represent the feelings of everyone in the neighborhood. We do know, however, that the outlooks expressed here are widely shared at Three Mile Island as well as other places studied by social scientists where toxic contamination has struck.

In the first place, accidents involving radiation are not bounded; they have no frame. We generally use the word "disaster" to refer to a distinct event that interrupts the accustomed flow of everyday life. Disasters adhere to Aristotle's rules of drama. They have "a beginning and a middle and end." They have "a certain magnitude" and yet are "easily taken in by the eye." They have *plot*, in short.

An alarm sounds the beginning. It is a signal to retreat, to take shelter, to

move to higher ground. A period of destruction then follows which may take no more than a brief, shattering moment or may last many days. Sooner or later, though, the disaster exhausts itself. The floodwaters recede, the smoke clears, the winds abate, the bombers leave, and an "all clear" is sounded either literally or figuratively.

An announcement is then heard that the emergency is over and that the time is now at hand for cleaning up and restoration. The pain may last, of course; the dreams may continue to haunt and the wounds prove difficult to heal. But the event itself is over, and what follows will be described as "aftermath."

### **The distinction between natural and technological disasters is hard to draw, but it usually seems distinct enough to victims.**

Radiological emergencies, however, violate all the rules of plot. Some of them have clearly defined beginnings, such as the explosion that signaled the emergency at Chernobyl; others begin years before anyone senses that something is wrong, as may turn out to be the case at Hanford. But they never end. Invisible contaminants remain a part of the surroundings—absorbed into the grain of the landscape, the tissues of the body, and, worst of all, into the genetic material of the survivors. An "all clear" is never sounded. The book of accounts is never closed.

The feelings of uncertainty—the sense of a lack of ending—can begin the very moment that the event ought, in logic, to be over. Here is the report of the mother of a family that left the vicinity of Three Mile Island upon hearing the governor's advisory and traveled several hundred miles:

"So we got in the car and headed south and we got as far as—I believe it was Durham, North Carolina, where we stopped first. And we didn't know how bad we were hurt. I remember when we went to the motel, I remember sleeping with my hands between my knees, and I was just trembling,

worried sick about what this had done to our family and the ones who were still back there."

That uncertainty can continue for months, years, even generations. Others may look on the scene from a safe remove in time or place and think of the emergency as over. But the ones who were there reckon the situation differently. Another mother:

"I had felt sure at that time that we had gotten quite a bit of radiation, and at that point you don't know if you're going to die next week . . . but because of this, was our life going to be cut short? Just what exactly was going to happen? We still don't know. Are the kids going to get it? Is my husband going to get it? It's nothing to dwell on, I can tell you, because if you dwelled on it every day you'd be crazy."

To be exposed to radiation or other forms of toxicity is often to be contaminated in some deep and lasting way, to feel dirtied, tainted, corrupted. "It will always be there, the contamination," said one woman of 60 speaking both of herself and the world around her. And a neighbor of hers, a man of 48, added: "I don't feel that the stuff is going to leave. It's still here with us. It's in our bodies, in our genes, and later on we're going to pay for it."

In the second place, radiation and most other toxic substances are without body. One cannot taste them, touch them, smell them, or see them, and for that reason they seem especially ghost-like and terrifying. Moreover, they invert the process by which disasters normally do harm. They do not charge in from outside and batter like a gust of wind or a wall of water. They slink in without warning, do no immediate damage so far as one can tell, and then begin their deadly work from within—the very embodiment of stealth and treachery.

The widely observed prohibition against chemical warfare is instructive here. Chemical weapons, clearly, have a special place in the human imagination, but it is not at all obvious why that should be so. In World War I, for example, shrapnel proved a good deal more lethal than gas, but no one suggested that it should be outlawed. The moral case, then, must lie in the way the two work rather than in the amount of damage they do. "Gas is a perfidious, impalpable, and cruel abomination," said an Allied report shortly



after the war,<sup>5</sup> and that puts the case well. It is furtive, invisible, unnatural. In most of its forms it moves for the interior, turning the process of assault inside-out and in that way violating the integrity of the body.

All of this suggests that people may not so easily become “unscared” of radiation and other forms of toxicity over time. And that raises a new set of questions: What happens to people who experience that kind of dread over long stretches of time? What will be the consequence if it finds a lasting place in the human imagination?

People exposed to disasters are apt to develop a sense of being out of control, of being caught up in forces that capture them and take them over. Feelings of helplessness and vulnerability are so common in moments of crisis that they are one of the identifying psychological symptoms of “trauma” and a prominent feature of what is widely called “the disaster syndrome.” Two more witnesses from Three Mile Island, the first a woman and the second a man:

“Fear, that’s what it is. Afraid. You’re sitting at the edge of your seat. It’s like we’re in their hands. It’s like we’re being manipulated by a couple of stacks.”

“I don’t know how to explain it. I just feel insecure. I just feel scared, afraid. It’s just like being in an airplane and you’re afraid because you don’t know [anything about] the pilot.”

Those insecurities, however, can broaden into something a good deal more ominous: a feeling of having lost a certain immunity to misfortune, a feeling that something terrible is almost bound to happen. One of the crucial jobs of culture is to help people camouflage the actual risks of the world around them—to edit reality in such a way that it seems manageable, to edit it in such a way that the perils pressing in on all sides are screened out of one’s line of vision as one pursues one’s everyday rounds. This kind of emotional insulation is stripped away, at least for the moment, in most severe disasters, but with a special sharpness in events like those considered here exactly because one can never assume that they are over. Two men in early middle age:

“You think, ‘When I walk into the house will there be some kind of radiation lingering?’ It came into your house and it’s going to stay there. You think, ‘Is the food in the refrigerator safe to eat?’ So you still have that insecure feeling of wondering what is going to happen at TMI. Are they telling us everything? . . . You always have that insecure feeling. I’ll always have it.”

“My mind is like a little computer. It’s always ticking. . . . I figure it even ticks when I’m asleep. I listen more to what people say to me. It’s hard to trust. Only the ones close to you it seems you can trust. I’m not being paranoid or

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nothing. It’s not like that. It’s just that these last couple of years . . . I see more now, I listen to more of what people say. I read between the lines more.”

Once victims reach that level of awareness, evidence that the world is a place of constant peril appears everywhere. It is a rare morning paper or evening broadcast that does not contain news of malfunctions at a nuclear power plant or releases from a nuclear weapons plant or problems with nuclear wastes. And if this is the kind of data your mind is sensitive to—the kind of data your eye, made sharp and canny by events of the recent past, is good at taking in—the gloomiest of forecasts can seem amply supported.

People who share such an outlook, understandably, can lose confidence in officialdom, not only in designated spokespersons but in certified experts as well. Bruce Dohrenwend, who headed the Task Force on Behavioral and Mental Health Effects of the President’s Commission on the Accident at Three Mile Island, thought that the sharp decline in respect for and trust of public officials was “one of the major findings, perhaps *the* major finding” of his various inquiries, and that conclu-

sion is supported by other research.<sup>6</sup>

For one thing, officials and experts may lie. Here’s a prim, middle-aged woman, made blunt by a sense of urgency:

“I think—should I say it?—I think that’s bullshit. I really do. I think it is. That’s how I feel about it. Everything’s under control. Bullshit. Nothing’s under control. I don’t believe anything they say, if you want to know the truth. I do not believe anything I hear from them.”

To make matters worse, people who have been sensitized by exposure to a toxic emergency can lose faith not only in the good *will* but in the good *sense* of those in charge of a dangerous universe. It is not at all obvious to them that officials can tell the truth even when they want to, for they do not know what is going on either.

“It’s like a child having a grenade in his hand and you lay it out there for him to play with. Sooner or later he’ll figure out how to pull the pin and blow his brains out. That’s what they’re doing down there with nuclear. That’s all there is to it. Just playing with it.”

Nor is that feeling confined to the immediate neighborhood. The *New Yorker*, reporting ten weeks after the 1984 catastrophe at Bhopal when the casualty estimates had reached 2,000 dead and 200,000 injured, put it well:

“What truly grips us in these accounts is not so much the numbers as the spectacle of suddenly vanished competence, of men utterly routed by technology, of fail-safe systems failing with a logic as inexorable as it was once—indeed, right up until that very moment—unforeseeable. And the spectacle haunts us because it seems to carry allegorical import, like the whispy omen of a hovering future.”<sup>7</sup>

The most important point to be made here, however, is that when the dread is lasting and pronounced, the spectacle of a failed technology can become the spectacle of a failed environment as well. This is an outlook born of the sense that poisons may now be lodged in the tissues of the body and that the surrounding countryside may be contaminated as well. “Dead ground,” said one man from Three Mile Island, speaking of the land he was standing on. But he did not mean that it was inert and lifeless like a moonscape. It was, for him, alive with dangers, a terrain in which fresh air and sunshine



AP/WIDE WORLD

Fleeing disaster: Bhopal chemical disaster in 1984 killed 2,000 and injured 200,000.

and all the other benevolences of nature are to be feared as sources of toxic infection. Imagine having to see the world through so dark a glass as these four women do:

"I don't even hang wash out anymore, and usually I'm a fanatic on hanging wash out. I don't want to bring in what maybe is out there."

"I used to lay out in the sun, but ever since TMI I don't lay out in the sun anymore, because you're thinking about the radiation. . . . What's to say that the stuff isn't coming over and just coming right down on me?"

"Well, one of the things was—you always felt that to get out into the fresh air was so much better than to be inside. Well . . . it's healthier inside now than outside. So we just spend more time inside. And when you do go out you have the feeling: should you be there? Is it going to harm you?"

"I do not want my grandchildren romping in my backyard. . . . I just don't know what's there. I can't see what's there."

It is important to note that these voices express a fear and a view of the world shared by but a portion of the people of Three Mile Island—and, for that matter, of the people living in other emergency sites about which we have information. But that portion is large by any measure and very likely a majority in many affected places. And, in any event, the fact that large numbers of people share a common dread not only in such well-known places as Three Mile Island and Chernobyl but also in lesser known places like Fernald and Rocky Flats and Hanford should tell us that something important may be happening, for the apprehension that appears to be so widely spread throughout the population can easily erupt into the feelings expressed here. It ranks, in the very least, as another "whispery omen of a hovering future."

The one thing we cannot afford to assume as we consider how to deal with this new species of trouble is that the fear it evokes is either a passing

whim or a fever that can be cooled by the kinds of calculation that experts make. This dread has its own reasons. It must be respected. ■

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